

# COLLEGE OF ENGINEERING - PUNE

(An Autonomous Institute of Govt. of Maharashtra.)

END SEM EXAMINATION NOV/DEC - 2011

## ENGINEERING GEOLOGY

Programme: T.Y. B.Tech  
Year: 2011-2012  
Duration: 3 Hrs

Branch: Civil  
Semester: 1  
Max. Marks: 50  
**18.11.11**

### Instructions:

1. Solve all the questions
  2. Figures to right indicates full marks
  3. Draw neat figures wherever required
- 

Q.1. What is River Rejuvenation? Explain in brief the phenomenon of development of Gorges and Incised Meanders? (10)

OR

Q.1. Explain in detail the Standard Stratigraphic Scale with reference to Indian Geology? (10)

---

Q.2. What are Building stones? What are the characters necessary for a stone to be called a Building stone? (10)

OR

Q.2. Write a note on the Varieties of Deccan trap Basalt? (10)

Q.3. Explain why Preliminary Geological Explorations are necessary for the initiation of major Civil Engineering Projects? (10)

OR

Q.3. Enumerate the Limitations of drilling with case histories (atleast 02) (10)

Q.4. Explain in brief Tunneling in Compact Basalts (10)

Q.5. Write short notes on:-

---

(i) Preservation of cores of Tachylitic Basalts (05)

(ii) Relation between type of dam and local geology (05)

---

X

X

---

**(CE-302) Surveying II**

**T.Y.B.Tech – CIVIL**

Timing: 02.00 pm – 05.00 pm

Day & Date: Tuesday 22/11/11

Duration: 3.00 hrs

Max. Marks: 50

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever required.
4. Assume suitable data if required and mention it clearly.

		Marks
Q.1	A) Explain phase of signal and derive the expression for phase correction when bright line is sighted.	(05)
	B) What is spherical excess? Explain various methods used for computation of the sides of a spherical triangle.	
	<b>OR</b>	
	Explain various types of signals.	(05)
Q.2	A) What is probable error? Derive side equation.	(05)
	B) What is station adjustment and figure adjustment? Explain approximate method of adjustment of a geodetic quadrilateral.	(05)
Q.3	A) Explain analytical method of solving three point problem.	(05)
	B) Discuss electro magnetic spectrum and explain applications of various wavelength regions in remote sensing.	
	<b>OR</b>	
	Explain an ideal remote sensing system and discuss shortcomings of real systems.	(05)
Q.4	A) What is crab and drift? Explain difference between map and aerial photograph.	(05)
	B) Explain terms vertical, tilted and oblique photographs. What is metric and stereometric camera?	
	<b>OR</b>	
	What is Mosaic? Explain different types of mosaics. Also state advantages and disadvantages of mosaics.	(05)
Q.5	Write notes on <b>any two</b> of the following	
	i) Radial line method	
	ii) Classification of remote sensing systems	
	iii) Photo interpretation	(10)

**College of Engineering, Pune**  
**T.Y. B.Tech. Civil Engineering**  
 (CE301)- (Geotechnical Engineering.)  
 End Semester Examination

- 1) Solve any **Five** questions  
 2) Draw necessary diagram wherever necessary

Max. Marks-50  
 Duration – 3hrs.

Q.1 A. Derive the following relation

05

$$1. \gamma_d = \frac{(G+e) \gamma_w}{1+e}$$

$$2. e S_r = wG$$

B. Sketch grain size distribution curves for uniformly graded, well graded and gap graded soils and discuss their characteristics?

05

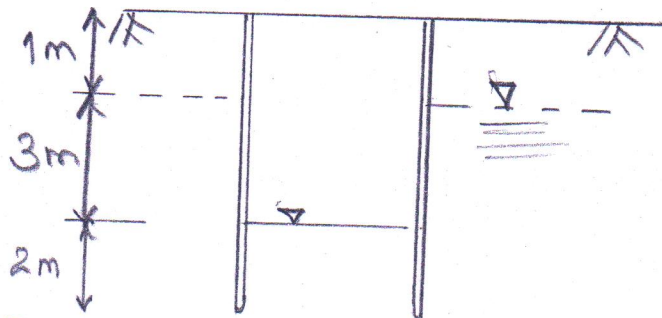
Q.2 A Explain

05

1. Pumping-in tests      2. Protective filter

B A trench is excavated in fine sand for a building foundation upto a depth of 4 m. The excavation was carried out by providing the necessary side supports for pumping water. The water level at the sides and bottom of the trench are as given in fig. Examine whether the bottom of the trench is subjected to a quick sand condition if.  $G=2.64$  and  $e=0.7$

05



Q.3 A Differentiate 1) Standard proctor test & Modified proctor test  
 1) compaction & consolidation

05

B A soil having specific gravity of solids  $G=2.75$  is subjected to proctor compaction testing a mould of volume  $V=945 \text{ m}^3$  The observations recorded are as follows-

05

Observation No.	1	2	3	4	5
Mass of wet sample(gm)	1389	1767	1824	1784	1701
Water content (%)	7.5	12.1	17.5	21.0	25.1

What are the values of maximum dry density and optimum moisture content ? Draw 100% saturation line?

- Q.4 A What is Coulomb's equation for shear strength of soil? Discuss the factors that affect the shear strength of the soil? 05
- B A series of undrained triaxial tests on samples of saturated soil gave following results 05
- |   |     |     |     |
|---|-----|-----|-----|
| $\sigma_3, \text{kN/m}^2$                                     | 100 | 300 | 500 |
| $u, \text{kN/m}^2$  | 48  | 140 | 290 |
| <b>Deviator stress at failure, <math>\text{kN/m}^2</math></b> | 130 | 485 | 645 |

Find the values of parameters  $c$  and  $\phi$

(a) With respect to total stress. (b) With respect of effective stress.

- Q.5 A Explain the concept of active and passive earth pressures with the help of Mohr circle, shear strength envelope? Also Explain effect of wall movement on earth pressure? 05
- B The backfill material of retaining wall of 8 m high is sand having  $\phi = 37^\circ$ . The water table is 2.5m below the top of the wall and supports a uniform surcharge of  $40 \text{kN/m}^2$ . The unit weight of sand above water table is  $18.7 \text{kN/m}^3$  and saturated unit weight below the water table is  $21.2 \text{kN/m}^3$ . by using Rankine's Theory determine the magnitude of the resultant active force. 05
- Q.6 A Derive expression for factor of safety against sliding for finite slope of 1)  $c-\phi$  soil 05
- B Write short note on 'Westergaard Analysis'. 05

-----END-----

College of Engineering, Pune  
Autumn semester End Sem Exam 2011

CE- 304      STRUCTURAL DESIGN- I

Class : T.Y. Civil  
Time : 2.00 pm to 5.00 pm

Date : 26.11.2011  
Max. Marks : 50

Instructions : *All questions are compulsory*

*Use of non-programmable calculator is allowed.*

Use of IS 800-2007, IS 875 and steel table is permitted provided no additional write up by pen or pencil.

Figures to right indicate marks.

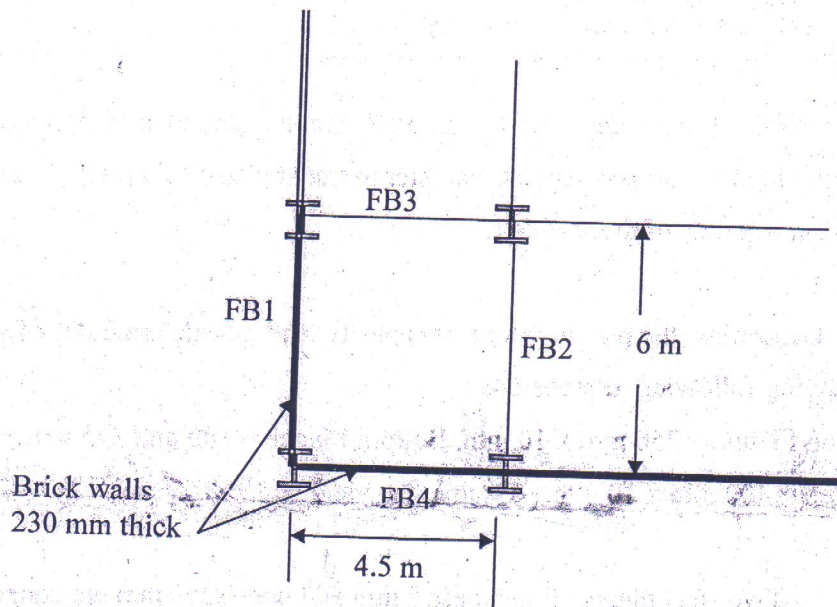
Assume suitable data if necessary.

---

- Q.1 A single unequal angle ISA 125 x 75x 8 is connected to a 10 mm gusset plate with its longer leg by 3 bolts of 16mm diameter to transfer tensile force. Determine the design tension capacity of the member. (7)
- Q.2 A) Determine the plastic Moment capacity and plastic modulus of section of the beam having following dimensions. (3)  
Top Flange = 250 mm x 10 mm, Bottom Flange = 180 mm x 15 mm,  
Web = 300 mm x 10 mm. Assume the yield strength of steel,  $f_y = 250$  MPa.
- B) Two steel plates of thickness 8 mm and width 250 mm are connected each other by double cover butt joint using cover plates of thickness 6 mm. Each plate is connected by six HSFG bolts of grade 8.8 with edge distance 50 mm and gauge 75 mm. The end distance is 60 mm and pitch is 80 mm. Determine the shear capacity of bolts used when slip resistance is designated at service load. The fasteners are in long slotted holes loaded parallel to the slot. Take the coefficient of friction as 0.25 (5)
- Q.3 Explain with neat sketch Framed connection, Un-stiffened seated connection and stiffened seated connection for simple beam connection. (6)
- Q.4. An ISJB 200 @ 97 N/m with effective span of 5 m is proposed to carry imposed udl of 30 kN/m. This secondary beam is to be connected with web of main beam ISMB 350 by using bolts of 16 mm having grade 4.8. Design simple framed connection by limit state method. Draw neat sketch. (7)

Q.5 Design a battened column with two I sections of length 8 m to carry an axial factored load of 2500 kN. One end of column is fixed and other end is hinged. Draw neat sketch showing connections. (10)

Q.6 A corner slab panel 6 m x 4.5 m is supported by steel beams as shown in Figure. Assume live load  $3 \text{ kN/m}^2$  and floor finish  $1 \text{ kN/m}^2$ . Thickness of RCC slab is 120 mm. Height of external wall is 3.5m. Design simply supported steel beam FB1 assuming effective span as 6 m. Assume that the beam is laterally supported. (12)



\*\*\*\*\*

Department of Civil Engineering  
 College of Engineering Pune  
**T.Y.B. Tech (Civil)**  
**(CE303) Structural Mechanics - II**  
**End Semester Examination**

Date: 24<sup>th</sup> November 2011

Duration: 3 hrs.

Max. Marks: 50

**Instructions:**

1. Solve all questions.
2. Make suitable assumptions and assume suitable data wherever required.

Q.1 Fig.Q.1 shows a continuous beam ABCD with constant flexural rigidity  $3200 \text{ kNm}^2$ . Support B sinks by 10 mm. Analyse the beam by Moment Distribution Method. Find final end moments at joints A, B, C and D. (08)

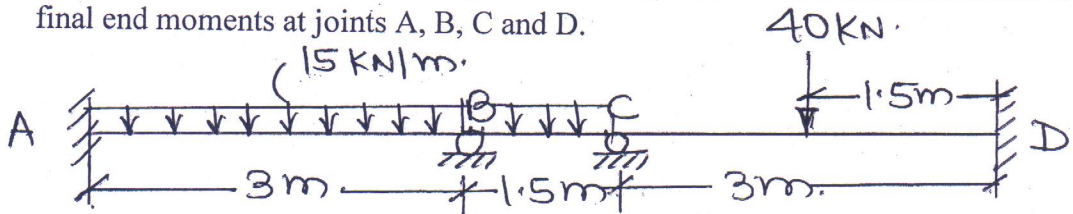


Fig. Q.1

Q.2 Analyse the beam shown in Fig. Q.2 by Flexibility Method. Find axial force in each spring. (08)

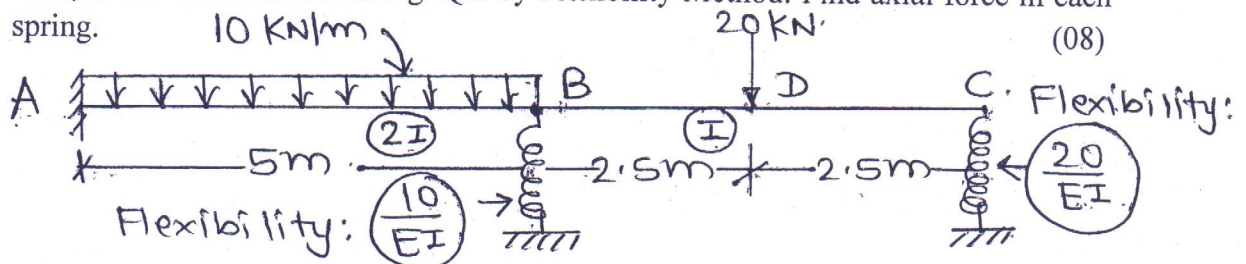


Fig. Q.2

Q.3 Analyse the rigid jointed frame shown in Fig. Q.3 by Stiffness Method. Draw bending moment diagram on tension side. (08)

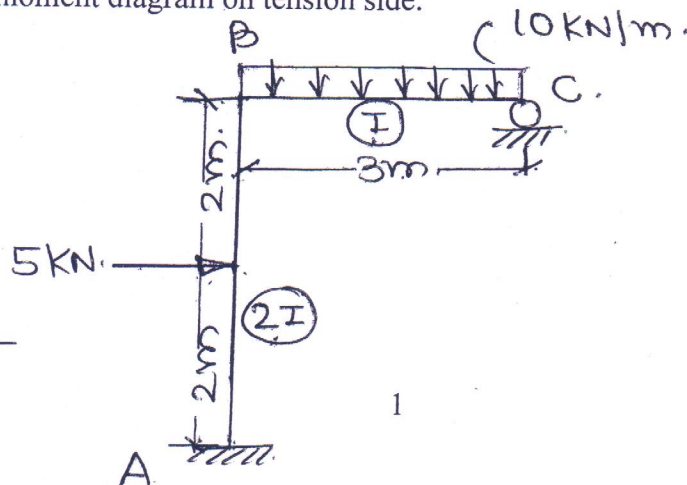
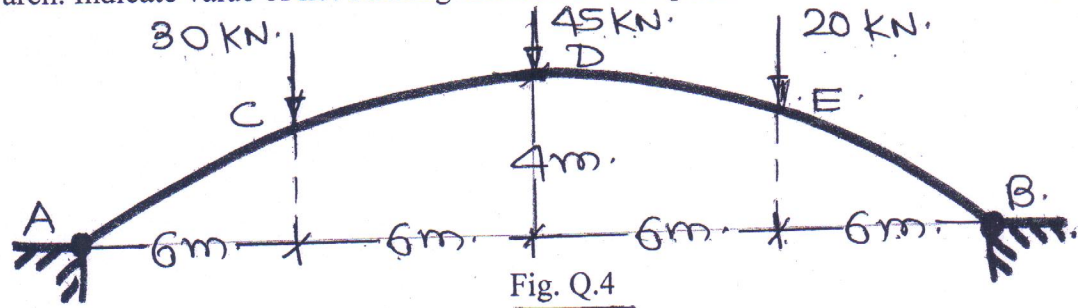
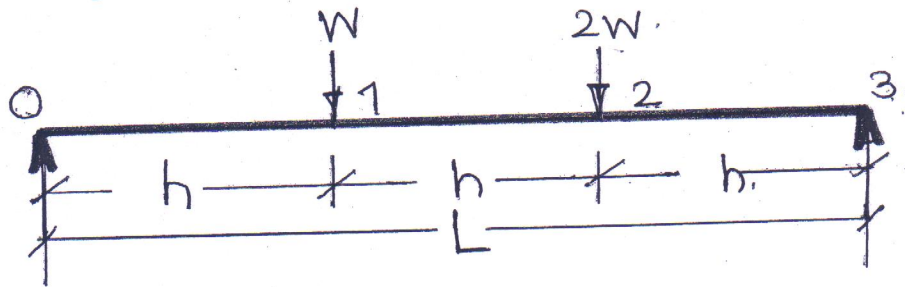


Fig. Q.3

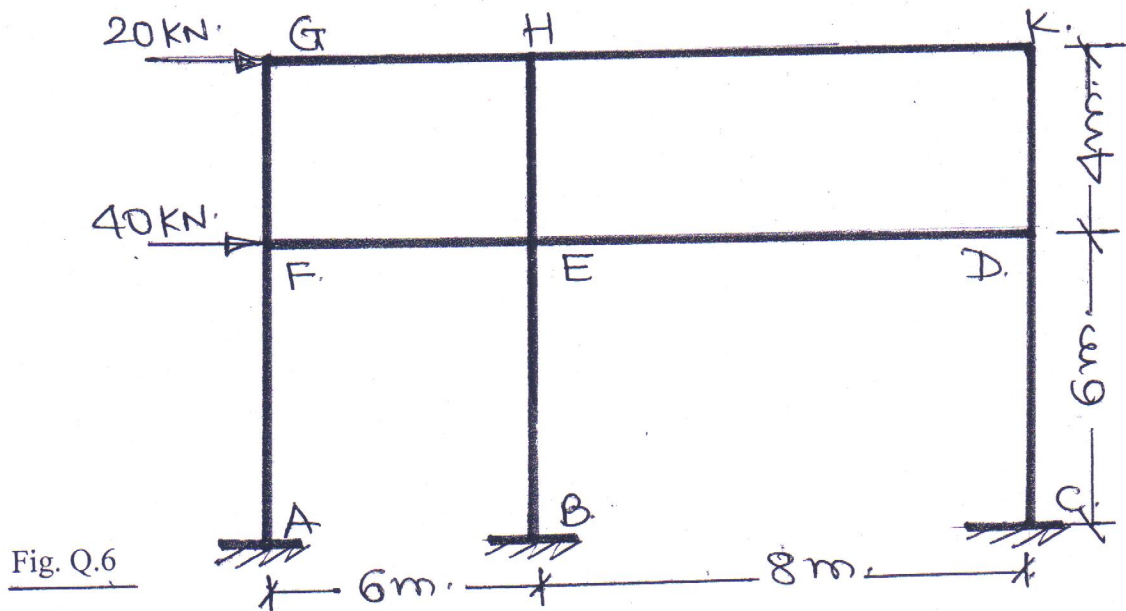
Q.4 A two-hinged parabolic arch is subjected to loading as shown in Fig.Q.4. Determine the radial shear and normal thrust at point E. Plot bending moment diagram for the arch. Indicate value of net bending moment at each point. (08)



Q.5 Fig. Q. 5 shows a simply supported beam of constant flexural rigidity. Find deflection at points 1 and 2 using second order finite differences. (08)



Q.6 Determine the approximate values of bending moment, shear force and axial force in each member of the rigid jointed plane frame shown in Fig. Q.6. Use portal method of analysis. Draw free body diagrams for both stories indicating all internal forces developed. Plot bending moment diagram on tension side, for the entire frame. (10)





# Department of Civil Engineering

## College of Engineering, Pune

### End Semester Examination

### CE 305 Transportation Engineering -I

Programme : TYBTECH

Specialization : Civil Engineering

Year : 2011-12

Date : 28.11.2011

Duration : 3Hr.

Max. marks : 50

Time 2 pm to 5 pm

#### Instructions:

1. Figures to right indicate full marks.
2. Draw neat sketches wherever required.
3. Assume suitable data if required and mention it clearly.

---

#### Que. 1: Answer the following:

- a) Describe any Ten major facilities to be present on any major port. (5)
- b) Illustrate the details and functioning of a light house. State its importance to various users. (5)

#### Que. 2: Answer the following:

- a) Explain the difference between break water wall & jetty; and wharf & quay. (5)
- b) Explain the concept of rigid Dolphin. Draw neat sketches to illustrate your answer. (5)

#### Que. 3: Answer the following:

- a) Explain the process of installation of permanent prefabricated concrete lining segments in a vertical shaft. Assume diameter of shaft as 8m and depth of 25m. (5)
- b) Draw a neat sketch of Square Crossing and an acute angled crossing. Show the provision of movement of train wheels. (5)

#### Que. 4: Answer the following:

- a) The captain of a vessel is at a height of 35m from sea level. His location from the light house just visible is 85km. Calculate height of the light house. (4)
- b) Explain with neat sketch the functioning of Buoys. (3)
- c) Explain in short, with a neat sketch, the function of 'Throat' in railway crossing. (3)

#### Que. 5: Answer the following:

- a) Describe with neat sketches the drilling patterns in hard rock tunnelling. Also illustrate various explosives used in drilling and blasting process in tunnelling. (5)
- b) Classify the Railway Signals base on different aspects. Explain locational signals in detail. (5)

College Of Engineering, Pune  
(An Autonomous Institute of Government of Maharashtra)  
End Semester Examination

---

IE- 303 Digital signal processing  
Semester - I

Year: 2011

Academic Year: 2011~2012

Duration: 3 hrs

Branch: Instrumentation and Control

Max. Marks: 50

**Instructions:**

1. Solve any five questions.
2. Figures to right indicate full marks.
3. Draw neat figures wherever required.
4. Assume suitable data if necessary.
5. Use of non programmable calculator is allowed

- Q.1 a. What do you mean by online and off line processes? 2
- b. Explain how the circular buffer technique is useful in online process? 3
- c. Draw and Explain the block diagram of SHARC® DSPs. 5
- Q.2 a. Explain any six types of operands used in DSP programming. 3
- b. Explain the direct addressing mode of the C5x DSP. 3
- c. write the meanings of following instructions 4
- i. LAMM, ii. LMMR, iii. SAMM, iv. SMMR
- Q.3 a. Determine the output response of a system having impulse response  $h(n) = (1/4)^n u(n)$  to the signal  $x(n) = 10 \sin(n\pi/2)$  4
- b. The system with impulse response  $h(n) = (0.9)^n u(n)$  subjected to the input signal  $x(n) = 4\sin n\pi/2 + 6 \cos n\pi/3$ , find its output response 6
- Q.4 a. State and prove the convolution property of DTFT 3
- b. Find the Discrete Fourier series and the Fourier series coefficient of  $x(n) = \{1, 1, 1, 1\}$  3
- c. Find the DFT of  $x(n) = \{1, 0, 0, 0\}$  4
- Q.5 a. Design a digital filter  $H(z)$ , using bilinear transformation method to be used in an AD –  $H(z)$  – DA structure to satisfy the following analog specifications 5
- a. Sampling rate 60K samples /sec
- b. Low pass filter with – 2 dB cutoff at 15 KHz

- c. Stopband attenuation of 10 dB at 30 KHz and greater  
d. Ripples pass band with monotonic transition and stop band
- b. Design a FIR of following specification 5  
 $H_d(\omega) = 0$  for  $0 \leq |\omega| \leq \pi/2$   
 $= 1$  for  $\pi/2 \leq |\omega| \leq \pi$   
with filter length 11 and bartlet window
- Q.6 a Design an analog filter with following specifications 5  
a. Maximally flat  
b. Pass all the signals of radian frequency greater than 200 rad/sec with no more than 2 dB of attenuation  
c. Stopband attenuation of greater than 20 dB for all  $\Omega$  less than 100 rad/sec.
- b Design a FIR of following specification 5  
 $H_d(\omega) = 1$  for  $\pi/3 \leq |\omega| \leq \pi/2$   
 $= 0$  otherwise  
with filter length 11 using Hanning window